



## ABSTRACT / ZUSAMMENFASSUNG / ABREGE

02004642.1

An apparatus for generating hydrogen gas in which hydrogen gas of a high purity is supplied to a hydrogen-utilizing device by using a decahydronaphthalene/naphthalene reaction. The apparatus includes a storage tank (10) in which decahydronaphthalene is stored as a crude fuel, a reaction tank (20) which has a catalyst and a heater (22) for heating the catalyst and which causes dehydrogenation of decahydronaphthalene supplied from the storage tank to the heated catalyst, and a separation tank (30) in which hydrogen-rich gas is separated out from naphthalene and hydrogen gas supplied from the reaction tank by using a hydrogen separation film and from which the separated hydrogen gas is discharged.

## XP-002282104

AN - 2001-246814 [26]  
AP - JP19990243182 19990830; EP20000118683 20000829; CA20002316068 20000816  
CPY - TOYX  
- TOYX  
DC - E36 L03 X16  
DS - AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT RO  
SE SI  
DR - 1532-P 1532-U  
FS - CPI;EPI  
IC - C01B3/24 ; C01B3/56 ; H01M8/04 ; H01M8/06  
IN - ISOGAI Y; KIMBARA M  
MC - E31-A02 L03-E04 L03-H05 N02-C N02-E N02-F  
- X16-C09  
M3 - [01] C101 C550 C810 M411 M424 M720 M740 M904 M905 N120 N209 N224 N262  
Q413; R01532-K R01532-P; 1532-P 1532-U  
- [02] A546 C810 M411 M730 M904 M905 Q421; R03031-K R03031-C  
- [03] A544 C810 M411 M730 M904 M905 Q421; R07077-K R07077-C  
- [04] A428 C810 M411 M730 M904 M905 Q421; R03084-K R03084-C  
- [05] A428 A940 B105 B720 B770 B809 B831 C802 C803 C804 C805 C806 C807  
M411 M730 M904 M905 Q421; RA1461-K RA1461-C  
- [06] A678 C810 M411 M730 M904 M905 Q421; R03247-K R03247-C  
- [07] A545 C810 M411 M730 M904 M905 Q421; R06899-K R06899-C  
PA - (TOYX ) TOYODA JIDOSHOKKI SEISAKUSHO KK  
- (TOYX ) TOYODA AUTOMATIC LOOM WORKS  
PN - JP2001068138 A 20010316 DW200131 H01M8/06 029pp  
- EP1081780 A2 20010307 DW200126 H01M8/04 Eng 037pp  
- CA2316068 A1 20010228 DW200126 H01M8/06 Eng 000pp  
PR - JP19990243182 19990830  
XA - C2001-074376  
XIC - C01B-003/24 ; C01B-003/56 ; H01M-008/04 ; H01M-008/06  
XP - N2001-175791  
AB - EP1081780 NOVELTY - Hydrogen supply system for fuel cell comprises: a  
fuel chamber for storing a liquid fuel which includes a hydrogen  
containing organic compound; a dehydrogenation apparatus for  
dehydrogenating the fuel to form hydrogen gas and a by-product; a  
gas-liquid separation apparatus for separating hydrogen gas from the  
by-product; and a recovery chamber for recovering and storing the  
by-product.  
- DETAILED DESCRIPTION - Hydrogen supply system (FCS) for supplying  
hydrogen to a fuel cell comprises:  
- (a) a fuel chamber (13) for storing a liquid fuel, which includes a  
hydrogen containing organic compound;  
- (b) a dehydrogenation apparatus (24) for dehydrogenating the fuel to  
form hydrogen gas and a by-product;  
- (c) a gas-liquid separation apparatus (20, 27, 32, 33, 34) for  
separating the hydrogen gas from the by-product by liquefying the  
by-product and for supplying the separated hydrogen gas to the fuel  
cell; and  
- (d) a recovery chamber (14) for recovering and storing the by-product  
liquefied in the gas-liquid separation apparatus.  
- INDEPENDENT CLAIMS are also included for the following:

- (i) a method for recycling a fuel used in a hydrogen supply system for use in a fuel cell;
- (ii) a refueling equipment for storing a fuel used in a hydrogen supply system for use in a fuel cell; and
- (iii) a system for recycling a fuel for use in a fuel cell.
- USE - Fuel cell system is used in vehicles, household appliances, and ship and land equipment.
- ADVANTAGE - The hydrogen supply system is relatively small, can supply pure hydrogen to the fuel cell, and discharges almost no carbon dioxide gas.
- DESCRIPTION OF DRAWING(S) - The diagram illustrates a schematic circuit diagram of a fuel cell system.
- Hydrogen supply system FCS
- Container 10
- Movable partition 12
- Fuel cell chamber 13
- Recovery chamber 14
- Dehydrogenation apparatus 24
- Gas-liquid separation apparatus 20, 27, 32, 33, 34
- Heat exhauster 26., 30
- Heat pump system HP
- (Dwg.1/19)

CN - R01532-K R01532-P R03031-K R03031-C R07077-K R07077-C R03084-K  
R03084-C RA1461-K RA1461-C R03247-K R03247-C R06899-K R06899-C

DRL - 1532-P 1532-U

IW - HYDROGEN SUPPLY SYSTEM FUEL CELL VEHICLE COMPRISE FUEL CHAMBER  
APPARATUS DEHYDROGENATE FUEL APPARATUS SEPARATE HYDROGEN GAS PRODUCT  
CHAMBER RECOVER STORAGE PRODUCT

IKW - HYDROGEN SUPPLY SYSTEM FUEL CELL VEHICLE COMPRISE FUEL CHAMBER  
APPARATUS DEHYDROGENATE FUEL APPARATUS SEPARATE HYDROGEN GAS PRODUCT  
CHAMBER RECOVER STORAGE PRODUCT

INW - ISOGAI Y; KIMBARA M

NC - 027

OPD - 1999-08-30

ORD - 2001-02-28

PAW - (TOYX ) TOYODA JIDOSHOKKI SEISAKUSHO KK  
- (TOYX ) TOYODA AUTOMATIC LOOM WORKS

TI - Hydrogen supply system for fuel cell used in vehicles comprises fuel  
chamber, an apparatus for dehydrogenating the fuel, an apparatus for  
separating hydrogen gas from by-product and a chamber for recovering  
and storing by-product